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Conservation Systems Research

Roller-Crimper Direction and Various Row-Cleaning Attachments for Cotton Establishment

RESEARCH PROJECT DESCRIPTION NO. 30

Roller-crimper flattening a winter cover crop

Researchers

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The Challenge

Cover crops are a vital part of conservation systems for many producers. However, great amounts of cover crop residue can create problems with any tillage practice that must be conducted in the spring, prior to planting. These crops must be managed appropriately to prevent problems with planting. The most common problem is hairpinning, where residue is pushed into the soil rather than being cleanly cut. This creates a situation where the seeds are unable to gain good seed-soil contact. Interactions between the residue and the planter itself can cause problems, as the residue may accumulate on

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the planter. To properly manage the cover crop in terms of maximizing its benefits and to minimize the interactions between planter and cover crop, there is a need to determine the best rolling direction with different row cleaning attachments.

The Experiment

Experiments at two Alabama Agricultural Experiment Stations will determine:

- Performance of four row-cleaner attachments in establishing a cotton crop within a killed cover crop residue;
- Planting efficiency (time required) for planting cotton seeds into various rolling patterns of a killed rye cover crop;
- Soil compaction from various rolling patterns of a killed cover crop;
- Weed emergence from various rolling patterns of a killed cover crop;
- Soil moisture and temperature effects associated with various row-cleaning attachments.

The two experimental sites, Belle Mina (northern Alabama) and Milstead (central Alabama) differ in their climate, soils, and other ecological factors. These differences will allow us to make observations under different conditions and apply what we learn to more regions.

row cleaner

Winter cover crops (rye) will be rolled and killed using roller-crimpers in directions parallel, perpendicular, and at 45-degrees to the planting direction. Cotton will be seeded into the rolled residue using several row-cleaning attachments. Cotton and weed stands, cover crop biomass, soil temperature, moisture, and compaction, and time required for operations will be monitored to evaluate the effectiveness of the various rolling directions and row-cleaning attachments.